

UNITED STATES DISTRICT COURT
SOUTHERN DISTRICT OF NEW YORK

UNITED STATES OF AMERICA,

-against-

LATIQUE JOHNSON, et al.

Defendants.

**MEMORANDUM
OPINION & ORDER**

(S5) 16 Cr. 281 (PGG)

PAUL G. GARDEPHE, U.S.D.J.:

The Government alleges that Defendant Latique Johnson is the leader of the “Blood Hound Brims,” a street gang operating primarily in New York City, upstate New York, and parts of Pennsylvania. Johnson is charged with racketeering conspiracy and narcotics conspiracy, two counts of assault and attempted murder in aid of racketeering, and using and carrying a firearm in connection with the racketeering and narcotics conspiracies. (S5 Indictment (Dkt. No. 418)) Trial of Johnson and two co-defendants – Brandon Green and Donnell Murray – began on February 19, 2019.

Count Two of the (S5) Indictment – one of the assault and attempted murder in aid of racketeering charges – alleges that on January 28, 2012, Johnson shot at members of a rival gang in a Bronx Restaurant (the “Bronx Restaurant Shooting”).¹ (S5 Indictment (Dkt. No. 418) ¶ 14) On December 11, 2018, the Government notified Johnson that it had identified the firearm used in the Bronx Restaurant Shooting, and provided Johnson with ballistics analysis reports prepared by New York City Police Department (“NYPD”) Detective Jonathan Fox. These reports conclude – based on “toolmark identification” analysis – that bullets collected

¹ This same conduct is alleged as an overt act in furtherance of the racketeering conspiracy. (See (S5) Indictment (Dkt. No. 418) ¶ 11(c))

from the scene of the Bronx Restaurant Shooting in January 2012 were fired from an AK 47 semi-automatic assault rifle that was the subject of an undercover purchase in Westchester County. (See Johnson Br. (Dkt. No. 468) at 12; Govt. Opp. Br. (Dkt. No. 483) at 26-27)

Johnson moved in limine to preclude Detective Fox's testimony in its entirety or, in the alternative, from offering an opinion that the ballistics evidence he analyzed was fired from the AK 47 assault rifle.² (Johnson Reply Br. (Dkt. No. 490) at 27; Feb. 27, 2019 Trial Tr.

² The relief Johnson seeks has been a moving target. On January 11, 2019, Johnson moved in limine to preclude toolmark evidence or, in the alternative, for a Daubert hearing, on the ground that toolmark identification is unreliable. (Johnson Br. (Dkt. No. 468) at 13). In his reply brief, however, Johnson states that he only asks the Court to "limit Detective Fox's testimony to a factual description of the method he applied and his observations of similarities and differences he found between sets of ballistics." (Johnson Reply Br. (Dkt. No. 490) at 27) Prior to the February 27, 2019 Daubert hearing, this Court sought clarification as to the relief Johnson seeks concerning Detective Fox's proposed testimony:

The Court: I also want to understand what Johnson's counsel's principal concern is about the ballistics evidence at this point in time. So we started out with a generalized attack on toolmark evidence, but I think it has morphed into an effort by Johnson's counsel to persuade me to cabin the opinions that Detective Fox can offer. Is that where we are at?

Mr. Spilke: I think that's right, your Honor.

...
The Court: So the defense is not attacking the broader concept of whether toolmark identification evidence should be admitted but, rather, the nature of the opinion that the expert can offer . . . and the degree of certainty that he can express about whether there is a match or not?

Mr. Spilke: That's correct.

(Feb. 27, 2019 Trial Tr. at 849-50) After the Daubert hearing, the Court inquired again about the relief Johnson is seeking, and Johnson's counsel reaffirmed that "it's permissible for Detective Fox to point out the similarities . . . and dissimilarities that he found, and to describe how he came to find [them]," but that Johnson seeks an order precluding the detective from opining that the ballistics evidence came from a particular weapon. (Id. at 981-82)

On March 1, 2019, however, Johnson's counsel "renew[ed] [Johnson's] request to preclude Detective Fox's testimony in its entirety." (Mar. 1, 2019 Johnson Ltr. (Dkt. No. 550) at 1)

at 981-82; Mar. 1, 2019 Johnson Ltr. (Dkt. No. 550) at 1) Johnson’s motion relies primarily on scientific reports published in 2008, 2009, and 2016.

On February 27, 2019 – in the midst of trial – this Court conducted a Daubert hearing concerning the methodology Detective Fox employed to analyze the toolmark evidence in this case. For the reasons stated below, Johnson’s motion to exclude Detective Fox’s testimony will be denied.

BACKGROUND

I. DETECTIVE FOX’S INITIAL ANALYSIS

About one month after the Bronx Restaurant Shooting, Detective Fox analyzed bullets, bullet fragments, and cartridge casings recovered from the crime scene. His findings are set forth in a February 28, 2012 report. (See GX 610) Detective Fox concludes that (1) thirteen 7.62 x 39 mm. caliber cartridge casings collected from the scene were discharged from the same firearm; (2) four bullets and bullet fragments were discharged from the same firearm; and (3) the relationship between these four bullets and four other bullets recovered from the scene cannot be conclusively determined. While these bullets share the same “class characteristics, [there are] insufficient individual characteristics for identification.” (Id.)

In an October 18, 2018 letter to Defendants, the Government disclosed that Detective Fox would testify as a ballistics expert, and would “explain the basics of firearms analysis and ballistics comparison, and the process by which firearms analysis and comparison reports are prepared and maintained in the normal course of the [NYPD] F[irearm] A[nalysis] S[ection]’s business.” The Government further disclosed that Fox would “testify that . . . the 7.62 caliber shell casings and bullet fragments collected from the January 28, 2012 shooting were fired by one gun; and . . . 7.62 caliber shell casings such as the ones collected from the

January 28, 2012 shooting are used in semi-automatic assault rifles.” (Oct. 18, 2018 Govt. Ltr. (Dkt. No. 483-1) at 3) Johnson did not object to this anticipated testimony. (Johnson Br. (Dkt. No. 468) at 12 n.1)

II. UNDERCOVER PURCHASE OF ASSAULT RIFLE ALLEGEDLY USED AT THE BRONX RESTAURANT SHOOTING, AND SUBSEQUENT DISCLOSURES

On September 25, 2013 – more than a year and a half after the Bronx Restaurant Shooting – an undercover officer of the Westchester County Police Department purchased an AK 47 semi-automatic assault rifle from Parrish Powell. (See Jan. 14, 2019 Govt. Ltr. (Dkt. No. 472) at 1) Powell – also known as “Scrams” – is a former member of the Blood Hound Brims. (Id.) According to the Government, the undercover purchase “was not part of the instant case or investigation, and was previously unknown by the NYPD or the agents and AUSAs investigating [Johnson’s case].” (Id.)

Powell was arrested on October 28, 2013, and later pled guilty to felon-in-possession, in violation of 18 U.S.C. § 922(g)(1). (See 13 Cr. 927 (KMK) (Dec. 3, 2013 Minute Entry); Information, 13 Cr. 927 (KMK) (Dkt. No. 5)) The information to which Powell pled guilty charged that he had possessed “a loaded semi-automatic 7.62/39 mm rifle and ammunition.” (See Information, 13 Cr. 927 (KMK) (Dkt. No. 5)) Powell told law enforcement after his arrest that he “had purchased the firearm from an Arab man.” (Jan. 14, 2019 Govt. Ltr. (Dkt. No. 472) at 2 n.1) At sentencing, Powell stated that he “knew of the firearm’s availab[ility] because people in M[t]. Vernon talked about another person want[ing] to sell it for fairly cheap.” (See 13 Cr. 927 (KMK) Def. Br. (Dkt. No. 8) at 6)

In September 2018, five years after the undercover buy that led to Powell’s arrest, “a cooperating witness [in the instant case] told the Government about a rumor that ‘Scrams’ . . . had sold an AK-47 to law enforcement, and that the gun was the same one used by Johnson

during the [Bronx] Restaurant Shooting.” (Jan. 14, 2019 Govt. Ltr. (Dkt. No. 472) at 1) The Government obtained the weapon from the Westchester County Police Department, and then provided it to the NYPD for purposes of conducting ballistics tests. (Id. at 1-2)

Detective Fox received test fires of the AK-47 assault rifle obtained from the Westchester County Police Department and compared cartridge casings and bullets from the test fires to the cartridge casings, bullets, and bullet fragments that are the subject of his February 28, 2012 ballistics report. (See Feb. 27, 2019 Trial Tr. at 902)

On December 5, 2018, Detective Fox issued a microscopic analysis report concerning his findings. (See GX 611) Detective Fox concludes that the cartridge casings produced from the test fires were “discharged from the SAME firearm” as the thirteen cartridge casings recovered from the scene of the Bronx Restaurant Shooting, “based on the observed agreement of their class characteristics and sufficient agreement of their individual characteristics.” (Id.) (emphasis in original)

Detective Fox further concludes that the bullets produced from the test fires were “discharged from the SAME firearm” as the four bullets and bullet fragments – discussed in his February 28, 2012 report – that were fired from the same weapon. Detective Fox’s opinion is “based on the observed agreement of their class characteristics and sufficient agreement of their individual characteristics.” (Id.)

Finally, as to the four bullets designated as “INCONCLUSIVE” in Detective Fox’s February 28, 2012 report, Detective Fox found that there was “agreement of their class characteristics but insufficient agreement or disagreement of their individual characteristics to either identify or eliminate the items [as] having been discharged from the same firearm.” (Id.)

Detective Fox provided his December 5, 2018 report to the Government on December 6, 2018. (Jan. 14, 2019 Govt. Ltr. (Dkt. No. 472) at 2) The Government provided the new ballistics report to Johnson on December 11, 2018, along with documents concerning Parrish Powell's arrest. (Id.) On December 28, 2018, Johnson "requested further discovery as to Detective Fox" from the Government. (Johnson Br. (Dkt. No. 468) at 12)

On January 6, 2019, the Government provided Johnson with an amended summary of Detective Fox's anticipated testimony. This summary states:

The Government expects that Det. Fox will testify about (i) his training, qualifications, and experience in the field of firearms and ballistics examination; (ii) the foundations of the field of firearms and ballistics examination, including the operation of firearms, the effects of the manufacturing process on firearms and ballistics evidence, toolmark identification, and use of the comparison microscope; (iii) his opinions regarding the ballistics evidence collected from the January 28, 2012 shooting and the Norinco 7.62 caliber semi-automatic rifle, and (iv) the basis for his opinions, which includes the application of his training and experience to the results of a microscopic examination and comparison of toolmarks and ballistics impressions on the evidence.

(See Jan. 6, 2019 Govt. Ltr. (Dkt. No. 483-1) at 5) The Government also provided Johnson with (1) copies of Detective Fox's February 28, 2012 and December 5, 2018 reports, which had been produced to Johnson previously; (2) copies of Detective Fox's underlying notes and documentation of his analysis; and (3) Detective Fox's testimony in United States v. White, No. 17 CR. 611 (RWS). (Id. at 5-6)

III. JOHNSON'S MOTION TO PRECLUDE OR LIMIT DETECTIVE FOX'S TESTIMONY

On January 11, 2019, Johnson moved to preclude Detective Fox's testimony. (See Johnson Br. (Dkt. No. 468)) Johnson's counsel subsequently acknowledged that "no court has excluded toolmark evidence in its entirety," however, and clarified that Johnson only sought to "limit Detective Fox's testimony to a factual description of the method he applied and his

observation of similarities and differences he found between sets of ballistics.” (Johnson Reply Br. (Dkt. No. 490) at 26-27) As discussed above, Johnson’s counsel confirmed before and after the Daubert hearing that Johnson was not seeking complete preclusion of Detective Fox’s testimony. Johnson nonetheless subsequently moved to preclude Detective Fox’s testimony in its entirety. (See Mar. 1, 2019 Johnson Ltr. (Dkt. No. 550) at 1)

DISCUSSION

I. LEGAL STANDARD

Whether expert testimony should be admitted is a matter committed to the trial judge’s “broad discretion.” Boucher v. U.S. Suzuki Motor Corp., 73 F.3d 18, 21 (2d Cir. 1996) (citations omitted). Under Federal Rule of Evidence 702,

[a] witness who is qualified as an expert by knowledge, skill, experience, training, or education may testify in the form of an opinion or otherwise if:

- (a) the expert’s scientific, technical, or other specialized knowledge will help the trier of fact to understand the evidence or to determine a fact in issue;
- (b) the testimony is based on sufficient facts or data;
- (c) the testimony is the product of reliable principles and methods; and
- (d) the expert has reliably applied the principles and methods to the facts of the case.

Fed. R. Evid. 702.

In Daubert v. Merrell Dow Pharmaceuticals, Inc., the Supreme Court instructed that Rule 702 imposes a “gatekeeping” responsibility on trial courts to “ensure that any and all scientific testimony or evidence admitted is not only relevant, but reliable.” Daubert, 509 U.S. 579, 589, 597 (1993). “Rule 702 is not limited to admissibility of scientific evidence alone, but also governs ‘technical’ or ‘specialized’ evidence which, by necessity, does not meet the rigors of scientific analyses,” and a district court’s gatekeeping responsibility under Daubert extends to

such non-scientific testimony as well. United States v. Willock, 696 F. Supp. 2d 536, 569 (D. Md. 2010) (citing Kumho Tire Co. v. Carmichael, 526 U.S. 137, 141 (1999); United States v. Taylor, 663 F. Supp. 2d 1170, 1173-74 (D.N.M. 2009)), aff'd sub nom. United States v. Mouzone, 687 F.3d 207 (4th Cir. 2012).

“Per Daubert and its progeny, a court’s Rule 702 inquiry involves the assessment of three issues: (1) the qualifications of the expert, (2) the reliability of the methodology and underlying data employed by the expert, and (3) the relevance of that about which the expert intends to testify.” Washington v. Kellwood Co., 105 F. Supp. 3d 293, 304 (S.D.N.Y. 2015) (citations omitted). The party seeking to introduce expert testimony bears “the burden of establishing by a preponderance of the evidence that the admissibility requirements of Rule 702 are satisfied.” United States v. Williams, 506 F.3d 151, 160 (2d Cir. 2007) (citations omitted).

“[W]hether a purported expert is qualified under Rule 702 is an inquiry to be resolved prior to all others.” Washington, 105 F. Supp. 3d at 304 (citations omitted). “Whether a proposed expert has the requisite qualifications depends on his or her educational background, training, and experience in the field(s) relevant to the opinions he or she seeks to give.” S.E.C. v. Toure, 950 F. Supp. 2d 666, 674 (S.D.N.Y. 2013).

In assessing reliability, “the district court must focus on the principles and methodology employed by the expert, without regard to the conclusions the expert has reached or the district court’s belief as to the correctness of those conclusions.” Amorgianos v. Nat’l R.R. Passenger Corp., 303 F.3d 256, 266 (2d Cir. 2002). In determining whether the expert’s opinion is reliable, a trial court should consider, inter alia, “the theory’s testability, the extent to which it ‘has been subjected to peer review and publication,’ the extent to which a technique is subject to ‘standards controlling the technique’s operation,’ the ‘known or potential rate of

error,’ and the ‘degree of acceptance’ within the ‘relevant scientific community.’” United States v. Romano, 794 F.3d 317, 330 (2d Cir. 2015) (quoting Daubert, 509 U.S. at 593-94). The inquiry is a “flexible one,” however, and there is no “definitive checklist or test” for determining the reliability of expert testimony. Id. (internal quotation marks and citations omitted). Indeed, “Daubert’s list of specific factors neither necessarily nor exclusively applies to all experts or in every case.” Kumho Tire, 526 U.S. at 141. “As the Supreme Court has explained, ‘[v]igorous cross-examination, presentation of contrary evidence, and careful instruction on the burden of proof are the traditional and appropriate means of attacking shaky but admissible evidence.’” Amorgianos, 303 F.3d at 267 (quoting Daubert, 509 U.S. at 596).

Finally, a trial court must consider whether the expert’s testimony will assist the jury. “This inquiry looks primarily to whether the testimony is relevant.” 523 IP LLC v. CureMD.Com, 48 F. Supp. 3d 600, 644 (S.D.N.Y. 2014) (citation omitted). “Evidence is relevant if: (a) it has any tendency to make a fact more or less probable than it would be without the evidence; and (b) the fact is of consequence in determining the action.” Fed. R. Evid. 401.

II. DETECTIVE FOX’S QUALIFICATIONS

It is undisputed that Detective Fox is qualified to offer expert testimony concerning ballistics analysis. Detective Fox has been a member of the NYPD for twenty-one years, and has worked in the NYPD’s Firearms Analysis Section since July 2004. (See Feb. 27, 2019 Trial Tr. at 889) Firearms examiners in this unit test-fire firearms recovered by law enforcement to determine if the firearms are operable, and microscopists microscopically

examine ballistics evidence such as bullets and cartridge casings to determine whether such items were fired from the same firearm.³ (Id. at 890)

After a six-month training program, Detective Fox became a firearms examiner in the Firearms Analysis Section. After 18 additional months of training, he became a microscopist. (Id. at 890-91) During the latter period, Detective Fox was trained in the standards of toolmark identification promulgated by the Association of Firearm Toolmark Examiners (“AFTE”). (Id.) This training addressed, inter alia, “how firearms were manufactured with particular tools, how the tools marked on those types of particular firearms, and how the characteristics from those tools were repeated and how to identify those individual characteristics.” (Id. at 891) Detective Fox has also passed numerous competency and proficiency tests related to firearms examination and toolmark identification. (Id. at 898-900)

Detective Fox has analyzed thousands of firearms and thousands of bullets, bullet fragments, and shell casings in his career. (Id. at 900) He has testified in court as a ballistics expert approximately 400 times. (Id.) The Court concludes that Detective Fox is well qualified, by virtue of his training and experience, to offer testimony as a ballistics expert.

III. TOOLMARK IDENTIFICATION

A. Overview

“Toolmarks” are marks “generated when a hard object (tool) comes into contact with a relatively softer object” – as, for example, “when the internal parts of a firearm make contact with the brass and lead that comprise ammunition.” (National Research Council of the

³ Although Detective Fox distinguishes between “firearms examiners” and “microscopists” (see Feb. 27, 2019 Trial Tr. at 890), judicial opinions and scientific literature concerning toolmark identification evidence commonly refer to “microscopists” as “firearms examiners.” This Court adopts that approach here.

National Academies, Strengthening Forensic Science in the United States: A Path Forward (2009), available at <https://www.ncjrs.gov/pdffiles1/nij/grants/228091.pdf> (“2009 NRC Report”) at 150) “The marks left by an implement . . . depend largely on the manufacturing processes – and manufacturing tools – used to create or shape it.” (Id.) Toolmark identification “is a discipline that is concerned with the matching of a toolmark to the specific tool that made it,” United States v. Otero, 849 F. Supp. 2d 425, 427 (D.N.J. 2012), aff’d, 557 F. App’x 146 (3d Cir. 2014), and the subset of toolmark analysis focused on firearms is concerned with matching the marks that are transferred to the surface of ammunition – bullets or cartridge casings – when a firearm is discharged to a specific firearm.

Because “[m]anufacturing tools experience wear and abrasion as they cut, scrape, and otherwise shape metal,” the theory developed that “any two manufactured products – even those produced consecutively with the same manufacturing tools – will bear microscopically different marks.” (2009 NRC Report at 150) This theory provides the basis for firearms examiners’ efforts to match toolmarks found on ammunition to specific firearms: “[f]irearms and toolmark examiners believe . . . that ‘individual characteristics’ of toolmarks may be uniquely associated with a specific tool or firearm and are reproduced by the use of that tool and only that tool.” (Id.; see also National Research Council of the National Academies, Ballistic Imaging (2008), available at <https://www.nap.edu/read/12162/chapter/1> (“2008 NRC Report”) at 46 (“The underlying theory of firearms identification depends critically on manufacturing processes, positing that the tools used to form component parts wear with use so that each part may share the same gross features[,] yet differ in microscopic (and, presumably, individual) ways.”))

As Detective Fox testified, the premise for “what we [microscopists] do” is “that the tools that are used to manufacture . . . firearms leave marks on the inside of the firearms that are unique to that particular tool. When the tools from manufacturing firearms . . . leave those marks, those marks are unique to that particular firearm after the tool comes in contact with the firearm.” (Feb. 27, 2019 Trial Tr. at 891)

When a semi-automatic assault rifle such as the AK-47 at issue here is fired, the cartridge – which contains the shell casing, bullet, propellant, and primer – comes into contact with the firearm’s breech face and firing pin. (*Id.* at 892, 893-94) The breech face “is the area where the cartridge casing rests.” (*Id.* at 894; *see also United States v. Green*, 405 F. Supp. 2d 104, 110 n.9 (D. Mass. 2005) (the breech face is “the inside rear of a gun, where the bullet rests prior to being fired.”; *United States v. Monteiro*, 407 F. Supp. 2d 351, 360 (D. Mass. 2006) (the breech face is “a flat surface behind the cartridge case against which the cartridge case is pushed” when a firearm is discharged)). “Generally, in the middle of the bre[e]ch face, [there is] an aperture or a hole” (Feb. 27, 2019 Trial Tr. at 894) where the firing pin – “a very hard steel rod that can be forced to protrude from the breech [face],” *Willock*, 696 F. Supp. 2d at 556 (citation omitted) – “comes through when you press the trigger [of] the firearm.” (Feb. 27, 2019 Trial Tr. at 894). “[W]hen the firing pin goes through that aperture, it strikes the back of the primer,” starting a chemical reaction that both “forc[es] the bullet out of the barrel and . . . forc[es] the cartridge to come rearward,” and “slam up against the bre[e]ch face of that particular firearm.” (*Id.*) By virtue of this contact, the firing pin and breech face impress toolmarks on the cartridge casing. (*Id.* at 894-95)

The barrel of a semi-automatic rifle also leaves marks on a bullet as it passes through the barrel. Firearms manufacturers produce gun barrels that contain raised and lowered

ridges – “lands” and “grooves” – that cause bullets to spiral and travel more accurately to the target. (Id. at 895) “[W]hen the bullet is traveling through those lands and grooves . . . marks on the inside of the barrel . . . will then be left on the bullet as it leaves the firearm.” (Id. at 895-96; see also United States v. Diaz, No. 05 Cr. 167 (WHA), 2007 WL 485967, at *1 (N.D. Cal. Feb. 12, 2007) (“The barrel of a gun is manufactured to impart a twist on the bullet as it travels, to ensure firing accuracy. The inside of a gun barrel is imprinted with cuts running the length of the barrel. The cuts within the barrel are called ‘grooves’ and the raised surfaces are called ‘lands.’ Those rifling characteristics create marks on the bullet as it travels down the barrel. The raised lands cut into the surface of the bullet. Likewise, the bullet surface expands to fill the recessed grooves. The corresponding impressions left on the bullet as it travels through the barrel are depressed ‘land impressions’ and raised ‘groove impressions.’”))

Toolmark identification theory does not posit that all toolmarks are unique. Detective Fox testified that toolmarks caused by the direction or number of lands and grooves in a firearm’s barrel are “class” rather than “individual” characteristics. Similarly, the caliber of a bullet is a “class characteristic” that is “predetermined by the gun manufacturer.” While a match between ballistics evidence and a particular firearm cannot be premised on “class characteristics,” a match can be ruled-out on the basis of class characteristics. (Id. at 896-97) “Individual characteristics,” by contrast, “are the unique characteristics left behind from [a] [manufacturing] tool.” (Id. at 897; see also 2009 NRC Report at 152 (“individual characteristics” refer to those “fine microscopic markings and textures that are said to be unique to an individual tool or firearm”); United States v. Sebborn, No. 10 Cr. 87 (SLT), 2012 WL 5989813, at *4 (E.D.N.Y. Nov. 30, 2012) (individual characteristics are “produced in the

manufacturing process by the random imperfections of tool surfaces . . . and by use of and/or damage to the gun post-manufacture” (quoting Otero, 849 F.Supp.2d at 427))

Detective Fox testified that these unique or “individual characteristics” are caused by the tools used to manufacture firearms. These tools “have sharp edges, and when these edges come into contact with the metal” on the various parts of the firearm the tools are shaping – such as the barrel, breech face, and firing pin – the metal “causes th[e] tool[s] to change,” such that the marks a particular tool leaves differs slightly from firearm to firearm. (Id. at 897-98) In his work with the NYPD’s Firearms Analysis Section, Detective Fox determines whether particular ballistics evidence was fired from a particular firearm by comparing individual characteristics under a microscope.

The methodology by which Detective Fox conducts toolmark analysis has been propounded by the Association of Firearm Toolmark Examiners. (Id. at 890-91) AFTE’s standards are “the field’s established standard[s].” United States v. Ashburn, 88 F. Supp. 3d 239, 246 (E.D.N.Y. 2015) Accordingly, the cases that have discussed toolmark identification evidence have focused on the AFTE methodology Detective Fox employs.

B. Detective Fox’s Methodology

Generally, the first step in evaluating whether ballistics evidence recovered from a crime scene was discharged from a particular weapon is to test-fire the weapon using the same kind of ammunition as the ammunition recovered. The two sets of ballistics are then compared. See Monteiro, 407 F. Supp. 2d at 361 (D. Mass. 2006). Detective Fox explained that when he prepared his December 5, 2018 report, he “received test fires” – performed by a different firearms examiner – “from a semiautomatic Norinco rifle that [Detective Fox] used to compare to the evidence in this case.” (Feb. 27, 2019 Trial Tr. at 902) That evidence consisted of the “13

cartridge casings and various pieces of fired bullets and bullet fragments” recovered from the scene of the Bronx Restaurant Shooting. (Id.)

The toolmark analysis “begins with an evaluation of class characteristics of the bullets and casings.” (President’s Council of Advisors on Science and Technology, Forensic Science in Criminal Courts: Ensuring Scientific Validity of Feature-Comparison Methods (2016), available at

https://obamawhitehouse.archives.gov/sites/default/files/microsites/ostp/PCAST/pcast_forensic_science_report_final.pdf (“PCAST Report”) at 11) The class characteristics for discharged bullets include the weight or caliber of the bullet, and the number, twist, and width of the lands and grooves. Diaz, 2007 WL 485967, at *2. The class characteristics for cartridge casings include caliber, type of breech face marks (parallel, arched, smooth, granular, or circular), and type of firing pin marks (circular, rectangular, or elliptical). Id.

Detective Fox testified that he performed this “preliminary investigation” when he began his analysis of the ballistics evidence in 2012. Detective Fox determined the class characteristics of the ballistics evidence – including the caliber of the cartridge casings and bullets, the twist of the rifling, the color of the cartridge casing and primer, and the type of breech face and firing pin marks – and listed these characteristics on a microscopy worksheet included in his February 28, 2012 report. (Feb. 27, 2019 Trial Tr. at 904-06) Detective Fox determined that the cartridge casings “all had the same class characteristics”; for example, the casings all reflected that they had been fired from a weapon with a hemispherical firing pin and granular breech face. (Id. at 907).

Where ballistics evidence shares the same class characteristics, the microscopist will go on to examine the ballistics evidence under a comparison microscope. This device

permits the examiner to view two pieces of ballistics evidence under a microscope simultaneously. (2009 NRC Report at 152) Detective Fox testified that in February 2012 – after determining that the cartridge casings he was analyzing had the same class characteristics – he examined the ballistics evidence under a comparison microscope “to try to determine if they were fired from the same firearm based on the individual characteristics.” (Feb. 27, 2019 Trial Tr. at 907) Detective Fox followed the same procedure in performing his December 2018 analysis comparing the crime scene evidence to the test fires from the AK 47 semi-automatic assault rifle. (Id.)

Detective Fox testified that the comparison microscope “is essentially two microscopes that[] [are] combined through an optical bridge that allows [the examiner] to look at two different pieces of evidence at the same exact time,” which “allows [the examiner] to bring each cartridge casing into view with each other; and, by doing so, . . . microscopically examine the individual characteristics to see if those individual characteristics match each other.” (Id. at 908) The comparison microscope has a “line of demarcation” – a black line that separates the two pieces of evidence under examination. For example, two different cartridge casings can be aligned on opposite sides of the “line of demarcation,” so that they “essentially look[] like one cartridge casing.” (Id. at 908-09) The demarcation line can be adjusted vertically or laterally, thus permitting the examiner to view different parts of the cartridge casings aligned in this fashion. The objective is to determine whether the individual characteristics on two casings “line up” with one another. (Id. at 909)

When Detective Fox determines that the individual characteristics of two casings or bullets match, he is required to photograph these microscopic images. He “must take a photo of any comparisons that [he] ma[k]e[s] that are positive,” in accordance with the accreditation

requirements for the NYPD laboratory. (Id. at 907-08) Microscopists are required to take such photographs “so that if a qualified examiner w[ere] to reexamine [another’s] case[,] . . . he could have an idea of what [the first examiner] was looking at and what [he] was comparing.” (Id. at 908)

Detective Fox’s February 28, 2012 and December 5, 2018 reports include such photographs. (GX 610 at 7; GX 611 at 6-7) For example, his December 5, 2018 report includes a photograph showing a test-fired cartridge casing from the AK 47 semi-automatic assault rifle aligned with a cartridge casing recovered at the scene of the Bronx Restaurant Shooting. (Id.) Detective Fox directed the Court’s attention to a firing pin impression “towards the top of the indent” shown in the photograph. Clearly visible in this photograph were parallel lines, or striations, from the two cartridge casings that aligned with one another. (Feb. 27, 2019 Trial Tr. at 910)

The AFTE method of firearm toolmark identification “enables opinions of common origin to be made when the unique surface of two toolmarks are in ‘sufficient agreement.’” (See PCAST Report at 60 (quoting Association of Firearm and Tool Mark Examiners, Theory of Identification as it Relates to Tool Marks: Revised, 43 AFTE J. 287 (2011)) According to AFTE, “sufficient agreement”

is related to the significant duplication of random toolmarks as evidence by the correspondence of a pattern or combination of patterns of surface contours. Significance is determined by the comparative examination of two or more sets of surface contour patterns comprised of individual peaks, ridges, and furrows. Specifically, the relative height or depth, width, curvature and spatial relationship of the individual peaks, ridges and furrows within one set of surface contours are defined and compare[d] to the corresponding features in the second set of surface contours. Agreement is significant when the agreement in individual characteristics exceeds the best agreement demonstrated between toolmarks known to have been produced by different tools and is consistent with agreement demonstrated by toolmarks known to have been produced by the same tool. The statement that “sufficient agreement” exists between two toolmarks means that the

agreement of individual characteristics is of a quantity and quality that the likelihood another tool could have made the mark is so remote as to be considered a practical impossibility.

Id.

AFTE acknowledges that “[c]urrently the interpretation of individualization/identification is subjective in nature,” although “founded on scientific principles and based on the examiner’s training and experience.” Id.

The “sufficient agreement” standard governs Detective Fox’s microscopic analysis: “[I]f I find that I have sufficient agreement of individual characteristics, I can say that two items were fired from the same firearm.” (Feb. 27, 2019 Trial Tr. at 908-09) On cross-examination, Detective Fox resisted articulating the “sufficient agreement” standard in definitive, quantitative, and objective terms. (See, e.g., id. at 948-951) He did, however, offer certain limiting principles.

For example, in discussing the “CMS” theory of toolmark identification – in which he is also trained – Detective Fox explained that CMS “tr[ies] to put a quantitative measure on comparing bullets to each other or striated evidence or other evidence that ha[s] striated marks.” (Id. at 915) Under the CMS theory of toolmark identification, ballistics evidence can be matched to a particular firearm where there are “six consecutive matching individual characteristics or six matching lines” on a particular impression, or “two areas of three” matching lines on a particular impression. (Id.) Detective Fox regards the CMS threshold for determining a match as insufficiently rigorous. (Id. at 916) Accordingly, Detective Fox will not find a “match” based solely on individual characteristics observed at one point on a casing or bullet, such as the firing pin impression described above. Instead, Detective Fox will look at

multiple impressions; at each impression, “everything should mark the same exact way one after another.” (Id. at 917)

IV. THE SCIENTIFIC EVIDENCE CITED BY JOHNSON

Johnson argues that (1) there is no empirical basis for the claim – central to toolmark identification – that individual firearms leave unique marks on bullets and cartridge casings; (2) toolmark identification experts’ opinions are impermissibly subjective, because there are no meaningful standards by which ballistics examiners determine whether there is a “match” between toolmarks; and (3) the error rate for toolmark examination is unknown. (Johnson Reply Br. (Dkt. No. 490) at 5-22) In support of these arguments, Johnson relies primarily on the 2008 National Research Council Report, Ballistic Imaging, available at <https://www.nap.edu/read/12162/chapter/1>; the 2009 National Research Council Report, Strengthening Forensic Science in the United States: A Path Forward, available at <https://www.ncjrs.gov/pdffiles1/nij/grants/228091.pdf>; and the 2016 report of the President’s Council of Advisors on Science and Technology, Forensic Science in Criminal Courts: Ensuring Scientific Validity of Feature-Comparison Methods (2016), available at https://obamawhitehouse.archives.gov/sites/default/files/microsites/ostp/PCAST/pcast_forensic_science_report_final.pdf. As discussed below, these reports challenge, to varying degrees, the scientific basis for toolmark identification analysis.

A. The Scientific Literature

Beginning in 2008, with the National Research Council’s publication of its Ballistic Imaging report, toolmark identification analysis came under scrutiny in scientific

literature. Although the 2008 NRC Report addresses ballistic imaging and not toolmark identification,⁴ the report highlights the subjective nature of a firearms examiner's analysis.

The purpose of the 2008 NRC Report was to assist the federal government in determining whether to establish a nationwide database of images of bullets fired from newly manufactured weapons so that ballistics evidence recovered from crime scenes could be matched against images in the database. As discussed above, however, ballistic imaging and toolmark identification analysis involve different techniques and serve different functions, and the authors of the 2008 NRC Report make clear that their study "is neither a verdict on the uniqueness of firearms-related toolmarks generally nor an assessment of the validity of firearms identification as a discipline." (Id. at 18 (emphasis in original); see also id. at 20 ("[T]he proposal for this study explicitly precluded the committee from assessing the admissibility of forensic firearms evidence in court, either generally or in specific regard to testimony on ballistic imaging comparisons. . . . [W]e do not in any way offer a determination of whether ballistics evidence should or should not be admissible in court proceedings.") (emphasis in original)).

Although the 2008 NRC Report makes clear that it is not addressing the reliability of toolmark evidence for purposes of court proceedings, the report highlights the subjective nature of the firearms examiner's inquiry: "Firearms identification ultimately comes down to a subjective assessment[;] specifically, a subjective probability statement[.]" (Id. at 54) Moreover, the report casts doubt on whether toolmark analysis is susceptible to objective,

⁴ Ballistic imaging involves a comparison of computerized images of bullets and cartridge casings, while toolmark identification involves direct microscopic comparison of toolmarks. (See 2008 NRC Report at 11) Moreover, the ballistic imaging database proposals discussed in the 2008 NRC Report were "tools for search," rather than a means of verification. Accordingly, the report's focus is on "the question of whether ballistic imaging technologies perform reliably as a search tool to assist human examiners," and not on the reliability of toolmark evidence generally. (Id. at 20)

quantitative standards: “[T]here is an incredible amount of difficulty attached to the development of a statistical basis for evidence evaluation in forensic fields like firearms examination.” (*Id.* (internal quotation marks and citation omitted)) In the firearms identification context, “derivation of an objective, statistical basis for rendering decisions is hampered by the fundamentally random nature of parts of the firing process. The exact same conditions . . . do not necessarily apply for every shot from the same gun.” (*Id.* at 55)

The 2008 NRC Report also questions a basic assumption underlying the firearms identification discipline: that individual firearms produce unique toolmarks that can be traced back to a specific weapon. The report states that “[u]nderlying the specific tasks with which the committee was charged is the question of whether firearms-related toolmarks are unique: that is, whether a particular set of toolmarks can be shown to come from one weapon to the exclusion of all others. Very early in its work this committee found that this question cannot now be definitively answered.”⁵ (*Id.* at 3) Indeed, the 2008 NRC Report goes on to state that “[t]he validity of the fundamental assumptions of uniqueness and reproducibility of firearms-related toolmarks has not yet been fully demonstrated. . . . A significant amount of research would be needed to scientifically determine the degree to which firearms-related toolmarks are unique or even to quantitatively characterize the probability of uniqueness.” (*Id.* at 3) The authors of the NRC Report do acknowledge, however, that “the creation of toolmarks [is] not . . . so random and volatile that there is no reason to believe that any similar and matchable mark exists on two

⁵ The authors of the 2008 NRC Report cast similar doubt on the reliability of fingerprint evidence: “[T]o date, there exists no definitive proof that no two people can have identical fingerprints. Instead, the credence of fingerprint evidence rests mainly on the assertion that – across all years in which fingerprints have been manually compared – no two people sharing the same individualized print has yet been found.” (2008 NRC Report at 19)

exhibits fired from the same gun. The existing research . . . is more than adequate testimony to that baseline level.” (Id. at 81)

In 2009, the National Research Council issued a report entitled Strengthening Forensic Science in the United States: A Path Forward. This report asserts that “the decision of the toolmark examiner remains a subjective decision based on unarticulated standards and no statistical foundation for estimation of error rates.” (2009 NRC Report at 153-54) Although the authors of the 2009 NRC Report concede that “[i]ndividual patterns from manufacture or from wear might, in some cases, be distinctive enough to suggest one particular source” (id. at 154), the authors contend that the process for making such a determination is not sufficiently “precise and repeatable”: “Because not enough is known about the variabilities among individual tools and guns, we are not able to specify how many points of similarity are necessary for a given level of confidence in the result.” (Id.)

Finally, in 2016, the President’s Council of Advisors on Science and Technology issued its report, Forensic Science in Criminal Courts: Ensuring Scientific Validity of Feature Comparison Methods. This report sharply criticizes AFTE’s “sufficient agreement” approach as “circular” and “clearly not a scientific theory.”⁶ The PCAST Report characterizes the “sufficient agreement” approach as merely “a claim that examiners applying a subjective approach can accurately individualize the origin of a toolmark.” (PCAST Report at 60) The PCAST Report goes on to state that while “it is not necessary that toolmarks be unique for them to provide useful information about whether a bullet may have been fired from a particular gun[,] . . . it is

⁶ The PCAST Report defines a “scientific theory” as “a comprehensive explanation of some aspect of nature that is supported by a vast body of evidence.” (PCAST Report at 60) (citation omitted)

essential that the accuracy of the method for comparing [toolmarks] be known based on empirical studies.” (Id. at 105) (emphasis in original).

The PCAST Report acknowledges that “[o]ver the past fifteen years, the field has undertaken a number of studies that have sought to estimate the accuracy of examiners’ conclusions,” but asserts that “many of the studies were not appropriate for assessing scientific validity and estimating the reliability because they employed artificial designs that differ in important ways from the problems faced in casework.” (Id. at 106) The PCAST Report concludes that “firearms analysis currently falls short of the criteria for foundational validity, because there is only a single appropriately designed study to measure validity and estimate reliability.” (Id. at 112)

Despite these criticisms of toolmark identification analysis, the PCAST Report makes no recommendation as to the admissibility of such evidence in legal proceedings: “[w]hether firearms analysis should be deemed admissible based on current evidence is a decision that belongs to the courts.” (Id.)

V. JUDICIAL TREATMENT OF TOOLMARK IDENTIFICATION EVIDENCE

Although this Court is aware of no decision that has outright excluded toolmark identification evidence as unreliable, over the past fifteen years the methodology for toolmark identification has come under increasing scrutiny in the courts.

“For decades, both before and after the Supreme Court’s seminal decisions in Daubert and Kumho Tire, admission of [toolmark identification evidence] . . . has been semi-automatic; indeed, no federal court has yet deemed it inadmissible.” Monteiro, 407 F. Supp. 2d at 364. In the mid-2000s, however, defendants began to argue that this type of evidence should be precluded under Daubert as insufficiently reliable. See, e.g., Diaz, 2007 WL 485967;

Monteiro, 407 F. Supp. 2d 351; United States v. Arnett, 2006 WL 2053880 (E.D. Cal. 2006); Green, 405 F. Supp. 2d 104; United States v. Hicks, 389 F.3d 514 (5th Cir. 2004); United States v. Foster, 300 F. Supp. 2d 375 (D. Md. 2004); United States v. Santiago, 199 F. Supp. 2d 101 (S.D.N.Y. 2002).

Some courts rejected challenges to toolmark identification evidence in cursory fashion, noting that such evidence has been routinely admitted for decades. See, e.g., Hicks, 389 F.3d at 526 (“the matching of spent shell casings to the weapon that fired them has been a recognized method of ballistics testing in this circuit for decades”); Santiago, 199 F. Supp. 2d at 111-12 (“The Court has not conducted a survey, but it can only imagine the number of convictions that have been based, in part, on expert testimony regarding the match of a particular bullet to a gun seized from a defendant or his apartment. It is the Court’s view that the Supreme Court’s decisions in Daubert and Kumho Tire did not call this entire field of expert analysis into question.”).

Other courts conducted lengthy Daubert hearings in response to challenges to the reliability of toolmark identification evidence. See, e.g., Green, 405 F. Supp. 2d at 107; Monteiro, 407 F. Supp. 2d at 355; Diaz, 2007 WL 485967, at *1. These courts expressed varying degrees of concern regarding the reliability of AFTE’s methodology. Compare Green, 405 F. Supp. 2d at 109, 114, 116, 119 (finding that firearms examiner’s standards were “either tautological or wholly subjective,” and noting the absence of (1) data concerning error rates, and (2) “national standards to be applied to evaluate how many marks must match,” but admitting the evidence “reluctantly” “because of [a belief] that any other decision will be rejected by appellate courts, in light of precedents across the country, regardless of [the judge’s] findings”) and Monteiro, 407 F. Supp. 2d at 369-71 (noting absence of a “universal standard for when an

examiner many declare a ‘match,’ deeming the AFTE standard “tautological,” and pointing out that no standards exist “for deciding whether a particular mark is a subclass or individual characteristic”) with Diaz, 2007 WL 485967, at *11, *13 (“Although the AFTE theory lacks an objective standard, competent firearms examiners operate under standards controlling their profession. The practiced eye of a firearms examiner can render reliable opinions based on an evaluation of the evidence. . . . A vital aspect of firearms identification is based on the experience these examiners have when they are doing identifications.”).

Although these courts all ultimately admitted toolmark identification expert testimony, they placed limitations on the degree of certainty the expert witness could express concerning his or her conclusions. See Green, 405 F. Supp. 2d at 108-09 (firearms expert could “only describe and explain the ways in which the earlier [recovered] casings are similar to the shell-casings test-fired from the . . . pistol found a year later”; he would not be permitted “to conclude that the shell casings come from a specific . . . pistol ‘to the exclusion of every other firearm in the world’”); Monteiro, 407 F. Supp. 2d at 372 (“because an examiner’s bottom line opinion as to an identification is largely a subjective one, there is no reliable statistical or scientific methodology which will currently permit the expert to testify that [there] is a ‘match’ to an absolute certainty, or to an arbitrary degree of statistical certainty”; accordingly, the expert would only be permitted to express her conclusions “to a reasonable degree of ballistic certainty”); Diaz, 2007 WL 485967, at *11 (same).

These opinions reflect the tension between the long history of routine admission of toolmark identification evidence, and a rising tide of criticism regarding forensic evidence in general.

With the publication of the scientific reports discussed above between 2008 and 2016, courts have carefully reexamined the reliability of toolmark identification evidence. See, e.g., United States v. Ashburn, 88 F. Supp. 3d 239 (E.D.N.Y. 2015); United States v. McCluskey, No. CR 10-2734 JCH, 2013 WL 12335325 (D.N.M. Feb. 7, 2013); United States v. Otero, 849 F. Supp. 2d 425 (D.N.J. 2012); United States v. Willock, 696 F. Supp. 2d 536 (D. Md. 2010), aff'd sub nom. United States v. Mouzone, 687 F.3d 207 (4th Cir. 2012); United States v. Cerna, No. CR 08-0730 WHA, 2010 WL 3448528 (N.D. Cal. Sept. 1, 2010); United States v. Taylor, 663 F.Supp.2d 1170 (D.N.M. 2009); United States v. Glynn, 578 F. Supp. 2d 567 (S.D.N.Y. 2008).

All of these courts admitted expert testimony concerning toolmark identification, rejecting arguments that the 2008-2016 scientific reports had rendered such evidence inadmissible. While acknowledging that toolmark identification evidence does not feature the full rigor of a science, and suffers from subjectivity and an absence of a precise, widely accepted methodology, these courts concluded that is nonetheless a proper subject for expert testimony. These courts found such evidence “sufficiently plausible, relevant, and helpful to the jury to be admitted in some form,” Willock, 696 F. Supp. 2d at 568, and reasoned that the weaknesses in toolmark identification can be effectively explored on cross-examination. These courts also precluded toolmark identification experts from expressing their opinions in terms of absolute scientific certainty. See, e.g., Ashburn, 88 F. Supp. 3d at 248-50; Monteiro, 407 F. Supp. 2d at 369; Cerna, 2010 WL 3448528, at *5.

Courts have also emphasized that the demanding scientific standards on display in the three reports require a level of certainty and infallibility not properly applied in a courtroom. See Otero, 849 F. Supp. 2d at 438 (“The Court recognizes, as did the National Research

Council[,] . . . that the toolmark identification procedures . . . do indeed involve some degree of subjective analysis and reliance upon the expertise and experience of the examiner. The Court further recognizes, as did the National Research Council's report, that claims for absolute certainty as to identifications made by practitioners in this area may well be somewhat overblown. The role of this Court, however, is much more limited than determining whether or not the procedures utilized are sufficient to satisfy scientists that the expert opinions are virtually infallible. If that were the requirement, experience-based expert testimony in numerous technical areas would be barred. Such an approach would contravene well-settled precedent on the district court's role in evaluating the admissibility of expert testimony.”); Ashburn, 88 F. Supp. 3d at 245 (“Even the [2009 NRC] Report, which criticized the lack of scientifically defined standards in the field, concluded that ‘[i]ndividual patterns from manufacture or from wear might, in some cases, be distinctive enough to suggest one particular source’ Thus, the difficult question is not whether ballistics qualifies for expert testimony under Rule 702, but whether [the expert’s] testimony should be limited in certain respects.”); Willock, 696 F. Supp. 2d 536 at 568-69 (“While these critics of the science underlying ballistic toolmark analysis raise legitimate concerns about whether the process has been demonstrated to be sufficiently reliable to be called a ‘science,’ . . . even were courts to widely accept . . . that [firearms toolmark identification] . . . is not ‘science,’ that would not presage the exclusion of all firearms toolmark identification evidence.”); Cerna, 2010 WL 3448528, at *4 (“These weaknesses, however, do not require the automatic exclusion of any expert testimony based on the AFTE theory. The weaknesses highlighted by the [2009 NRC Report] – subjectivity in a firearm examiner’s identification of a ‘match’ and the absence of a precise protocol – are concerns that speak more to an individual

expert's specific procedures or application of the AFTE theory, rather than the universal reliability of the theory itself.”).

VI. ANALYSIS

At the outset, it is worth noting that Detective Fox testifies as someone with specialized, technical knowledge beyond the ken of the average juror. Fed. R. Evid. 702. He does not present himself as a scientist and – as discussed below – he does not contend that his opinions are infallible. Detective Fox's expertise is grounded in training and vast practical experience, rather than in many years of academic study. See Willock, 696 F. Supp. 2d at 571 (“While, on the existing record, it may be debatable whether [toolmark identification] is a ‘science,’ it clearly is technical or specialized, and therefore within the scope of Rule 702”); Monteiro, 407 F. Supp. 2d at 365 (“Firearm identification evidence straddles the line between testimony based on science and experience. . . . Science is in the background, . . . but its application is based on experience and training.”); Otero, 849 F. Supp. 2d at 431 (“This Court expresses no opinion on whether the practice of firearms and toolmark identification constitutes a ‘scientific’ discipline because that is not the question before the Court. Rather, the Court must consider whether the Government's proffered expert testimony is reliable according to the principles of Kumho Tire.”); McCluskey, 2013 WL 12335325, at *5 (same).

It is also worth noting that the authors of the three scientific reports explicitly acknowledged that the rigorous, entirely objective, infallible, and certain standards that prevail within a scientific discipline are not necessarily properly applied in a courtroom. Indeed, the authors were careful to emphasize that their conclusions should not be read as commentary on the admissibility of toolmark evidence in courts. (See 2008 NRC Report at 20 (“[T]he proposal for this study explicitly precluded the committee from assessing the admissibility of forensic

firearms evidence in court, either generally or in specific regard to testimony on ballistic imaging comparisons. . . . [W]e do not in any way offer a determination of whether ballistics evidence should or should not be admissible in court proceedings.” (emphasis in original); 2009 NRC Report at 12 (“[w]hether firearms analysis should be deemed admissible based on current evidence is a decision that belongs to the courts.”); PCAST Report at 112 (same)).⁷

In conducting a Daubert hearing during trial, and in independently analyzing the reliability of Detective Fox’s toolmark identification methodology, the Court has focused on the following: (1) whether his analysis is capable of being tested; (2) whether his methods have been subjected to peer review; (3) whether his methods are subject to standards controlling their application; (4) the known or potential error rate for Detective Fox’s methodology; and (5) its degree of acceptance in the relevant scientific community. See Romano, 794 F.3d at 330 (quoting Daubert, 509 U.S. at 593-94).

⁷ Indeed, certain participants in the scientific studies have testified that the reports were not intended to suggest that toolmark analysis is unreliable for purposes of expert evidence in court. See Cerna, 2010 WL 3448528, at *5 (“Notably, the co-chair of the committee that issued the [2009 NRC] [R]eport, Judge Harry T. Edwards, has specifically noted that the [2009 NRC] report is not a law reform proposal and that ‘whether forensic evidence in a particular case is admissible under applicable law is not coterminous with the question whether there are studies confirming the scientific validity and reliability of a forensic science discipline.’” (quoting The Need to Strengthen Forensic Science in the United States: The National Academy of Science’s Report on the Path Forward; Hearing Before the S. Comm. on the Judiciary, 111th Cong. 10 (Mar. 18, 2009) statement of Judge Harry T. Edwards, Co-Chair, Committee on Identifying the Needs of the Forensic Science Community, available at <https://www.judiciary.senate.gov/imo/media/doc/09-03-18EdwardsTestimony.pdf>)); Casey, 928 F. Supp. 2d 397, 399-400 (D.P.R. 2013) (“[T]he United States has produced the sworn statement of the Chairman of the group that produced the 2008 N[RC] report[, Dr. Rolph]. In that statement, Dr. Rolph states that the purpose of the 2008 N[RC] report was not to pass judgment on the admissibility of ballistics evidence in legal proceedings. . . . In fact, the question of legal admissibility ‘was explicitly ruled out of [his committee’s] charge.’ . . . [H]is committee did not actually evaluate the fundamental assumptions of firearms and toolmark identification that underlay many courts’ allowance of ballistics and firearm expert testimony.” (internal citations omitted)).

Consistent with all reported decisions that have considered the issue, this Court concludes that toolmark identification analysis – at least as performed by Detective Fox – is sufficiently reliable to be presented to the jury.

A. Testability

The “testability” of a theory refers to “whether the expert’s theory can be challenged in some objective sense, or whether it is instead simply a subjective, conclusory approach that cannot reasonably be assessed for reliability.” Fed. R. Evid. 702 Advisory Committee Notes; see also Colon ex rel. Molina v. BIC USA, Inc., 199 F. Supp. 2d 53, 78 (S.D.N.Y. 2001).

There appears to be little dispute that toolmark identification is testable as a general matter. The PCAST Report observed that “[o]ver the past 15 years, the field has undertaken a number of studies that have sought to estimate the accuracy of examiners’ conclusions.” (PCAST Report at 106) While the PCAST Report dismissed “many of the[se] studies [as] not appropriate for assessing scientific validity and estimating the reliability because they employed artificial designs that differ in important ways from the problems faced in casework,” PCAST acknowledged that one study was appropriately designed, and called for additional such studies to be performed. (Id. at 111)

Indeed, many courts have relied on the existing scientific literature – including the studies examined in the PCAST Report – in concluding that toolmark identification analysis satisfies the “testability” factor of Daubert. See Ashburn, 88 F. Supp. 3d at 245 (“The AFTE methodology has been repeatedly tested. . . . For example, researchers have performed ‘validation studies’ seeking to validate the underlying theory that marks left even by consecutively manufactured firearms can be differentiated by examiners.” (citation omitted));

United States v. Taylor, 663 F. Supp. 2d 1170, 1176 (D.N.M. 2009) (“[A] variety of studies . . . have been referenced before this Court demonstrating that the methods underlying firearms identification can, at least to some degree, be tested and reproduced.”); Otero, 849 F. Supp. 2d at 432 (summarizing “validation studies” and concluding that “[t]he literature shows that . . . many studies demonstrating the uniqueness and reproducibility of firearms toolmarks have been conducted”); United States v. Johnson, 2015 WL 5012949, at *3 (same).

While some courts have acknowledged the limitations of these “validation studies,” see McCluskey, 2013 WL 12335325, at *6 (“Admittedly, these [studies] do not appear to have been ‘blind’ studies. . . . Nonetheless, these kinds of results do suggest at least some level of reproducibility.”), even the PCAST Report – which is the report most critical of toolmark identification – conceded that these studies “indicate that examiners can, under some circumstances, associate ammunition with the gun from which it was fired.” (PCAST Report at 111)

The “testability” of Detective Fox’s methods and conclusions is also supported by the annual proficiency testing he undergoes. See Diaz, 2007 WL 485967, at *5 (examiners “frequently took (and continue to take) proficiency tests where the true answers were known. The vast majority of the time, examiners were able, using the theories applied in actual casework, to reach correct conclusions based on the samples before them”); see also Johnson, 2015 WL 5012949, at *3 (same). While these proficiency tests do not validate the underlying assumption of uniqueness upon which the AFTE theory rests, they do provide a mechanism by which to test examiners’ ability – employing the AFTE method – to accurately determine whether bullets and cartridge casings have been fired from a particular weapon.

Finally, the photographic documentation and independent review requirements about which Detective Fox testified further demonstrate the testability of toolmark identification. As discussed above, Detective Fox testified that he is required to photograph “positive comparisons” so that “if a qualified examiner w[ere] to reexamine [his] case[,] . . . he could have an idea of what [Detective Fox] was looking at and what [he] was comparing” in reaching his conclusions. (Feb. 27, 2019 Trial Tr. at 908) Moreover, Detective Fox testified that a second microscopist reviews his conclusions, by performing “an independent verification and technical review of [Detective Fox’s] findings to see if they are correct or not.” The firearms examiner conducting the review is not aware of Detective Fox’s conclusions when he or she conducts the review. (*Id.* at 974-75) These procedures demonstrate that Detective Fox’s methodology can be “challenged . . . and reasonably assessed for reliability.” *See, e.g., Monteiro*, 407 F. Supp. 2d at 369 (“[A]lthough the process of rendering an opinion is primarily subjective[,] . . . the existence of the requirements of . . . review and documentation ensure sufficient testability and reproducibility to ensure that the results of the technique are reliable.”); *Diaz*, 2007 WL 485967, at *5 (“Furthermore, practically all [firearms examination] laboratories . . . require examiners to thoroughly document their results and findings. Any identifications must be photodocumented. Examiners must indicate the primary areas on which they base identifications. The industry standard also requires confirmation by at least one separate examiner when identification is reached by the first examiner.”); *McCluskey*, 2013 WL 12335325, at *6 (“[The firearms expert] testified that industry standards generally require an examiner to document in detail, through note-taking and photographs, the basis for his or her findings. [He] also testified that industry standards require confirmation by at least one other examiner whether the first examiner reaches

an identification. These factors, too, indicate at least some significant level of testability and reproducibility.” (internal citations omitted)).

The Court concludes that Detective Fox’s methodology can be and has been tested sufficiently to satisfy the first Daubert factor.

B. Peer Review and Publication

In applying the second Daubert factor, courts consider “whether the technique has been subject to peer review and publication.” Daubert, 509 U.S. at 593.

There is a substantial body of literature concerning the AFTE methodology. The Government cites to seven such studies; the 2008 NRC Report, the 2009 NRC Report, and the PCAST Report also cite to and discuss various publications addressing AFTE’s firearms identification theory and methods. (See Gov’t Opp. Br. (Dkt. No. 483) at 32, 33 & 33 n.14; 2008 NRC Report at 70; 2009 NRC Report at 154 n.63; PCAST Report at 107-08)

Most of the literature concerning the AFTE theory and methodology has been published in AFTE’s peer-reviewed journal, the AFTE Journal. This journal

publishes articles, studies and reports concerning firearm and toolmark evidence. It has a formal process for submission of articles, including “specific instructions for writing and submitting manuscripts, assignment of manuscripts to other experts within the scientific community for a technical review, returning of manuscripts to other experts within the scientific community for clarification or re-write, and a final review by the Editorial Committee.”

McCluskey, 2013 WL 12335325, at *6 (quoting Richard Grzybowski, et al., Firearm/Toolmark Identification: Passing the Reliability Test Under Federal and State Evidentiary Standards, 35 AFTE J. 209, 220 (2003)).

Johnson contends that articles in the AFTE Journal should be viewed with suspicion, because “AFTE is a trade group whose members must necessarily derive a substantial portion of their income from firearms examination. . . . Its members, thus, have an interest in

establishing that individual firearms leave unique toolmarks.” (Johnson Reply Br. (Dkt. No. 490) at 9)⁸ Courts addressing this Daubert factor have determined that the AFTE Journal scholarship qualifies as peer-reviewed literature. See Diaz, 2007 WL 485967, at *8 (“The fact that articles submitted to the AFTE Journal are subject to peer review weighs strongly in favor of admission.”); Otero, 849 F. Supp. 2d at 433 (“AFTE theory is subject to peer review through submission to and publication by the AFTE Journal of validation studies which test the theory The Court thus concludes that the Government has presented evidence in support of this [peer review and publication] factor.”); see also Monteiro, 407 F. Supp. 2d at 366) (“AFTE publishes a peer reviewed journal . . . which contains numerous articles validating the current technique of firearm identification. . . . Other peer reviewed articles have not universally been laudatory of the current technique of identification. . . . Although there appears to be a disagreement in the peer reviewed literature as to the reliability of the AFTE method of identification, consensus is not necessary [to satisfy this factor].”)

The Court concludes that the toolmark identification methodology used by Detective Fox has been subject to peer review and publication. Accordingly, this Daubert factor weighs in favor of admission.

⁸ Many journals written and edited by professionals have a vested interest in promoting the techniques that are the subject of the journal. For example, the editors of a publication concerning radiology arguably have a vested interest in promoting the safety and efficacy of radiation for various conditions. And a doctor or journal receiving financial support from a pharmaceutical company for research concerning a particular drug arguably has a motive to publish an article favorable to the drug in question. While such factors should be disclosed, and may be the subject of cross-examination, they do not justify ignoring peer-reviewed literature for purposes of making a Daubert determination.

C. Controlling Standards

Daubert directs that courts “ordinarily should consider . . . the existence and maintenance of standards controlling the technique’s operation” when the admissibility of a particular scientific technique is at issue. Daubert, 509 U.S. at 594.

Johnson asserts that “[i]t has been observed countless times that no standards exist for toolmark identification.” (Johnson Reply Br. (Dkt. No. 490) at 13) This is an overstatement. AFTE has a well-known standard for toolmark identification, which the Government and Detective Fox have repeatedly invoked – “sufficient agreement.” As discussed above, both courts and the scientific community have voiced serious concerns about the “sufficient agreement” standard, characterizing it as “tautological,” “wholly subjective,” “circular,” “leav[ing] much to be desired,” and “not scientific.” The Court shares some of these concerns. Having heard Detective Fox’s testimony, however, the Court is persuaded that his methodology is governed by controlling standards sufficient to render it reliable.

As an initial matter, several aspects of Detective Fox’s methodology discussed in connection with the “testability” Daubert factor constitute “standards controlling . . . [toolmark identification’s] operation.” For example, the photographic documentation and verification requirements are industry standards “adhered to by most, if not all, other crime labs in the country.” Diaz, 2007 WL 485967, at *11. Similarly, the extensive AFTE training and proficiency testing Detective Fox has received – which appear to be administered to firearms examiners nationwide – also supply such standards. See Willock, 696 F. Supp. 2d at 571-72 (“despite the fact that there is no universal agreement as to how much correspondence” is necessary to find sufficient agreement, “the AFTE training courses and CTS proficiency testing

... demonstrate the existence of standards governing the methodology of firearms-related toolmark examination” (internal quotation marks omitted)).⁹

Moreover, Detective Fox’s testimony about his methodology demonstrates the existence of standards controlling his determination as to whether “sufficient agreement” exists with respect to a particular comparison. As discussed above, the photographic comparisons included in Detective Fox’s December 5, 2018 report demonstrate how he can determine – from the individual characteristics of two casings or bullets – whether striations line up or “match” one another. The photographic comparisons at issue here reflect striations that line up exactly between the test-fired cartridge casings and those recovered from the scene of the Bronx Restaurant Shooting. The “matching” of the striations is stark, even to an untrained observer. Accordingly, the issue is not whether the ballistics evidence in this case shares specific individual characteristics. Instead, the issue is at what point Detective Fox concludes that the shared individual characteristics he has observed and photographically documented are sufficient to declare that the casings or bullets were fired from the same firearm.

On cross-examination, Detective Fox resisted defense counsel’s efforts to have him specify the number of matching individual characteristics that are necessary before a “sufficient agreement” conclusion can be reached. (See, e.g., Feb. 27, 2019 Trial Tr. at 948-951) Instead, Detective Fox stated that “[e]very single case is different,” and that he employs a holistic approach incorporating his “training as a whole” and his experience “based on all the

⁹ “CTS” is an abbreviation for “Collaborative Testing Services.” Willock, 696 F. Supp. 2d at 543. According to the Willock court, CTS provides the “only widely used proficiency tests for firearm toolmark examiners.” Id. Detective Fox testified that his proficiency tests are conducted by CTS, which is “a private entity which constructs tests for numerous American and foreign laboratories.” (Feb. 27, 2019 Trial Tr. at 899; United States v. Llera Plaza, 188 F. Supp. 2d 549, 556 (E.D. Pa. 2002))

cartridge casings and ballistics that [he] ha[s] identified and compared.” (Feb. 27, 2019 Trial Tr. at 950)

Detective Fox did set out certain principles that ground his conclusions, however. For example, the CMS standard – six consecutive matching striations or two groups of three matching striations – represents a “bottom standard” or a floor for declaring a match. Detective Fox will not declare that “sufficient agreement” exists unless microscopic examination reveals a toolmark impression with one area containing six consecutive matching individual characteristics, or two areas with three consecutive matching individual characteristics. (*Id.* at 915-16) Detective Fox’s analysis does not end at that point, however. Instead, Detective Fox goes on to examine every impression on the ballistics evidence. “All these lines should match,” as well, and if they do not, Detective Fox will not find “sufficient agreement.” (*Id.* at 917)

These criteria provide standards for Detective Fox’s findings as to “sufficient agreement.” While Detective Fox’s ultimate findings are subjective – a fact which he readily concedes (*see, e.g., id.* at 926) – “all technical fields which require the testimony of expert witnesses engender some degree of subjectivity requiring the expert to employ his or her individual judgment, which is based on specialized training, education, and relevant work experience.” *United States v. Simmons*, No. 2:16 Cr. 130, 2018 WL 1882827, at *5 (E.D. Va. Jan. 12, 2018), report and recommendation adopted, No. 2:16 Cr. 130, 2018 WL 658693 (E.D. Va. Feb. 1, 2018) (emphasis removed). Accordingly, “the presence of a subjective element in a technical expert’s field does not operate as an automatic bar to admissibility.” *Id.*

The Court concludes that sufficient controlling standards exist to admit Detective Fox’s testimony.

D. Error Rate

Daubert counsels that courts “ordinarily should consider the known or potential rate of error” of a particular technique. Daubert, 509 U.S. at 594. Johnson asserts that here “the frequency of examiner error is not known.” Johnson also notes that the PCAST Report criticizes the absence of known error rates across a wide range of comparison-based forensic disciplines, including toolmark identification. (Johnson Reply Br. (Dkt. 490) at 13; PCAST Report at 110-12)

Courts addressing this Daubert factor in the context of toolmark identification have concluded that the methodology’s error rate is difficult or impossible to determine and, at any rate, is presently unknown. See, e.g., Ashburn, 88 F. Supp. 3d at 246 (“The court finds that due to the subjective nature of the inquiry, a definite error rate is impossible to calculate. . . .”); Diaz, 2007 WL 485967, at *9 (“No true error rate will ever be calculated so long as the firearm-examiner community continues to rely on the subjective traditional pattern matching method of identification”). Although concluding that it is impossible to calculate a definite error rate, courts have generally found that the available evidence – derived, for the most part, from studies of proficiency tests – suggests that the error rate is sufficiently low to weigh in favor of admissibility. See Diaz, 2007 WL 485967, at *9 (“The error rates for the CTS data from 1978 to 1997 revealed false-identification error rates to be 0.9% for firearms and 1.5% for toolmarks. From 1998 to 2002, the error rates were 1.0% for firearms and 1.2% for toolmarks. . . . It is reasonable to infer that the error rates among trained examiners are quite low.”); United States v. Johnson, 2015 WL 5012949, at *4 (same); Ashburn, 88 F. Supp. 3d at 246 (“[T]he error rate, to the extent it can be measured, appears to be low, weighing in favor of admission of the expert testimony.”).

Johnson argues that these courts relied on unreliable and now-stale data, and cites the PCAST Report's determination that the toolmark identification error rate may be as high as 1 in 46. (Johnson Reply Br. (Dkt. 490) at 19, 21) Johnson's argument is unpersuasive. As an initial matter, courts have considered the error rate argument Johnson makes, and have concluded that the likely error rate does not argue in favor of preclusion. See McCluskey, 2013 WL 12335325, at *7 (recognizing that the true error rate of toolmark identification is "probably higher" than the 1-2% reported from proficiency tests that were "easier than real-world forensic ballistic examinations" and "not blind," but concluding that the 5% error rate produced from a European study mimicking the imperfect samples of real-world examinations "is not excessively high," and "weighs slightly in favor of admitting the challenged expert testimony"); Monteiro, 407 F. Supp. 2d at 367-68 (acknowledging that the error rate cited in Diaz "may not stand up to scrutiny due to variations in the difficulty of the tests and the conditions under which they were taken," but observing that "there is no evidence that the [proficiency] tests are inaccurate or otherwise deficient," and concluding that the known error rate is "not unacceptably high"). Finally, even accepting the PCAST Report's assertion that the error rate could be as high as 1 in 46, or close to 2.2%, such an error rate is not impermissibly high. See id.

The Court concludes that the absence of a definite error rate for toolmark identification does not require that such evidence be precluded.

E. Degree of Acceptance

Finally, Daubert states that "[w]idespread acceptance" of a given technique "can be an important factor in ruling particular evidence admissible." Daubert, 509 U.S. at 594. There is no dispute here that toolmark identification analysis is a generally accepted method in the community of forensic scientists, and firearms examiners in particular.

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For the reasons discussed above, the Daubert factors – on balance – weigh in favor of admitting Detective Fox’s testimony. Moreover, the weaknesses in the methodology of toolmark identification analysis are readily apparent, have been discussed at length in the scientific literature, and can be addressed effectively on cross-examination. These weaknesses are also not particularly complicated or difficult to grasp, and thus are likely to be understood by jurors if addressed on cross-examination. See Monteiro, 407 F. Supp. 2d at 369 (“Defense experts may testify about both the limitations of the methodology and the evidence . . . in a way accessible to the jury.”); Green, 405 F. Supp. 2d at 108 (“[The witness’s] expertise could arguably be challenged in a way that would be accessible to the jury both on cross-examination and via defense testimony.”).

Accordingly, Johnson’s motion to preclude Detective Fox’s testimony will be denied.

VII. LIMITATIONS ON DETECTIVE FOX’S TESTIMONY

Johnson seeks, in the alternative, an order precluding Detective Fox from offering his opinion that the ballistics evidence recovered from the scene of the Bronx Restaurant Shooting came from the AK 47 semi-automatic assault rifle obtained through a 2013 undercover purchase by the Westchester County Police Department. Johnson asks that the Court “limit Detective Fox’s testimony to a factual description of the method he applied and his observations of similarities and differences he found between sets of ballistics.” (Johnson Reply Br. (Dkt. No. 490) at 27) The Court will not so limit Detective Fox’s testimony.

Some courts addressing the admissibility of toolmark evidence have imposed limits on the opinions that a ballistics expert may offer, typically by barring the expert from

testifying that his or her opinions reflect absolute scientific certainty. See United States v. White, No. 17 CR. 611 (RWS), 2018 WL 4565140, at *3 (S.D.N.Y. Sept. 24, 2018) (collecting cases).

However, research has revealed only two cases in which courts have granted the relief Johnson now seeks – an order barring a firearms examiner from offering his or her opinion that ballistics evidence matches a particular firearm.

In United States v. Green, 405 F. Supp. 2d 104, 124 (D. Mass. 2005), the court acknowledged that a firearms examiner “may be able to identify marks [on ballistics evidence] that a lay observer would not,” and so permitted the examiner “to testify as to his observations.” However, the court precluded the expert from opining that shell casings “matched” a particular firearm to the exclusion of all other guns. Id. at 123-24. In doing so, the court repeatedly expressed concern about “the reliability of the expert’s methodology in the case at bar. . . . The question is whether the approach used by the expert in this case allows for [the] identification.” Id. at 119 (emphasis in original). There was a solid foundation for the court’s misgivings: the expert “ha[d] never been formally tested by a neutral proficiency examiner”; the expert’s laboratory had never “been certified by any professional organization”; and when the expert first “reviewed the evidence when it was submitted to him five years ago,” he “took no notes, recorded no measurements, made no photographs, and drew no diagrams.” The expert also “agreed that to the extent there were protocols for toolmark examination, he did not follow them in this case.” Id. at 107, 108.

No such circumstances are present here. Accordingly, Green provides no basis for this Court to preclude Detective Fox from offering his opinion that the ballistics evidence

recovered from the scene of the Bronx Restaurant Shooting matches the AK 47 semi-automatic assault rifle purchased by a Westchester County Police undercover officer.

In United States v. Jovon Medley, 17 Cr. 242 (PWG) (D. Md.), the court issued a lengthy ruling from the bench permitting a firearms examiner to

express an opinion that the marks . . . on the crime scene cartridges are consistent with the marks that were found on the test fire from the .45 known to be associated with the defendant, but [prohibiting the firearms examiner from] express[ing] the opinion that they were fired by the same gun. . . .

(Medley, 17 Cr. 242 (D. Md.), Apr. 24, 2018 Tr. (Dkt. No. 490-1) at 173) In permitting the examiner to “identify which marks he says are consistent” with marks seen on the test fire ballistics associated with the defendant’s .45 caliber firearm, the court stated that “the jury can draw whatever inferences [it wishes].” (Id. at 181) According to the Medley court, “the jury itself can look at known and unknown samples and decide whether [they] came from the same gun. . . .” (Id. at 174)

While the Medley court believed that it would be “helpful to the jury for [the firearms examiner] to testify with his photographs and matching up the marks that he saw that were similar and pointing out the characteristics that were similar between the firearm cartridges fired at the scene and what was test fired,” the court expressed concern that the expert’s report and notes “d[id] not provide enough information to show how the methodology was applied in this particular case.” (Id. at 170, 172) In particular, the court noted that the firearms expert had provided “no numerical value that allows us to know whether [the striation matches were] one, . . . two, . . . four, . . . 12, [or] 17.” (Id. at 139) The firearms expert in Medley testified that he “did not” use the CMS methodology or any other quantitative methodology in determining that the toolmarks were in “sufficient agreement” to justify a finding that the ballistics evidence at issue matched the test fires. (Id. at 25 (“we don’t use quantification in this”); id. at 28 (“I’m

really not focusing in on a set number.”); id. at 32-33 (“The Court: Just so the record is clear, you did not use the CMS methodology here, right? The Witness: I did not. . . .”)

The Medley court identified many other shortcomings in the firearms examiner’s approach. With respect to the photographs of the ballistics evidence there at issue, the judge complained that the examiner had not identified which striations he had relied on in reaching his conclusion that the ballistics evidence and the test fires had been fired from the same gun:

. . . what we don’t know is from this face sheet or from the photographs is when you line up a portion of the firearm component looked at, and you look to see lines that seem to come together and lines that don’t, which ones were the ones that he relied upon in reaching his conclusion that there was sufficient agreement.

(Id. at 167) The judge also noted that the “split-screen” photographic images were at different levels of magnification, with one photograph showing a cartridge at “36 magnification” and another photograph displaying a cartridge at a “56 level of magnification.” (Id. at 167-68) The Medley court also concluded that the examiner’s procedures were not consistent with the AFTE standard. (Id. at 170) (“that’s not what the standard from the AFTE says”). As to peer review, the ballistics evidence and the examiner’s work were reviewed both by another examiner in his office – the Prince George’s County crime lab – and by a District of Columbia firearms examiner. The court criticized the peer reviewers for having “looked at the ammunition,” rather than “look[ing] at just the report itself.” (Id.)

Many of the Medley court’s criticisms do not apply here. For example, unlike the expert in Medley, Detective Fox uses the CMS methodology as a prerequisite for finding a match. In other words, Detective Fox will not find a match unless there are “six consecutive matching individual characteristics or six matching lines” on a particular impression, or “two areas of three” matching lines on a particular impression. (Feb. 27, 2019 Trial Tr. at 915) As discussed above, however, the CMS standard only provides a “floor” or prerequisite for

Detective Fox to find a match. Even where the CMS standard is met, Detective Fox will not declare a match unless, as to other toolmarks, “everything . . . mark[s] the same exact way one after another.” (*Id.* at 916-17)

Moreover, unlike the ballistics photographs at issue in *Medley*, here the agreement in striations between the photographs of the ballistics evidence and the test fires are obvious, even to an untrained observer. (*See* GX 611 at 6-7)

Unlike in *Medley*, there is no claim here that Detective Fox did not properly follow AFTE methodology or AFTE standards.

While the photographs presented in Detective Fox’s report do involve somewhat different levels of magnification (*see id.*), the Court does not view this technique as problematic, at least as it was employed here.

With respect to peer review, this Court does not agree with the *Medley* court that it is improper for a reviewing firearms examiner to conduct an independent analysis of the ballistics evidence, particularly given that the NYPD reviewer is ignorant of the determination made by Detective Fox.¹⁰

¹⁰ The Court also finds the resolution in *Medley* – letting “the jury itself . . . decide whether [ballistic evidence and test fires] came from the same gun,” *Medley*, 17 Cr. 242 (D. Md., Apr. 24, 2018 Tr. (Dkt. No. 490-1) at 174) – with no expert assistance – problematic. This approach invites the jury to speculate and is likely to result in jury confusion. Testimony that toolmarks on casings or bullets are “consistent” with toolmarks on test-fired casings or bullets – without further explanation – provides the jury with no basis for determining whether such consistencies suggest that the ballistics evidence and test fires were fired from the same gun.

As discussed above, the similarities between the toolmarks shown in the photographs attached to Detective Fox’s reports are – for the most part – apparent to a lay observer. The reason Detective Fox’s testimony will assist the jury is that, based on his training and experience, he can explain the circumstances in which such similarities indicate that ballistics evidence in fact came from the same firearm as test fires.

Based on its review of Detective Fox's reports and notes – as supplemented by his testimony at the Daubert hearing – this Court is satisfied that there is ample information here to demonstrate how Detective Fox carried out his analysis. The Court concludes that the bench ruling in Medley does not justify the limitation on Detective Fox's testimony that Johnson seeks.

In the vast majority of cases in which courts have limited the opinions a firearms examiner may offer, the limitation has addressed whether the firearms examiner can state his or her opinion to a specific degree of scientific certainty. See, e.g., White, 2018 WL 4565140, at *3 (prohibiting expert from testifying “to any specific degree of certainty as to his conclusion that there is a ballistics match between the firearms seized . . . and those used in various shooting[s],” but permitting the expert to state his personal belief as to his degree of certainty if asked on cross-examination); Ashburn, 88 F. Supp. 3d at 249 (precluding expert from testifying that he was “certain” or “100%” sure of his conclusions that certain items match, or that a match is identified to “the exclusion of all other firearms in the world,” or that it is a “practical impossibility” that any other gun could have fired the recovered ballistics evidence); Glynn, 578 F. Supp. 2d at 574-75 (permitting expert to express opinion only in terms of “more likely than not”); Simmons, 2018 WL 1882827, at *5-8 (limiting expert's testimony to “a reasonable degree of ballistic or technical certainty”); Diaz, 2007 WL 485967, at *4 (limiting expert's testimony to a “reasonable degree of certainty in the ballistics field”); Taylor, 663 F. Supp. 2d at 1179-80 (limiting expert's testimony to a “reasonable degree of certainty in the firearms examination field”); Monteiro, 407 F. Supp.2d at 355 (limiting expert's testimony to a “reasonable degree of ballistic certainty”).

Often these limitations are imposed because of judicial or defense counsel concern that the firearms examiner intends to offer an opinion with absolute or 100% certainty.

See Glynn, 578 F. Supp. 2d at 574 (noting “the tendency of ballistics experts . . . to make assertions that their matches are certain beyond all doubt, that the error rate is ‘zero,’ and other such pretensions”)).

Having heard Detective Fox’s testimony at the Daubert hearing, it is clear that he does not intend to assert – and the Government does not intend to elicit – any particular degree of certainty as to his opinions regarding the ballistics match. (See Govt. Opp. Br. (Dkt. No. 483) at 36 (stating that the Government “does not intend to elicit from Detective Fox on direct examination the degree to which he is certain of his conclusions.”)) Indeed, Detective Fox’s repeated concession at the Daubert hearing that his conclusions are “based on [his] subjective opinion” stands in stark contrast to the “tendency of [other] ballistics experts . . . to make assertions that their matches are certain beyond all doubt.” Glynn, 578 F. Supp. 2d at 574. Detective Fox also testified that he “would never” state his conclusion that ballistics evidence matches to a particular firearm “to the exclusion of all other firearms . . . in a court proceeding[,] . . . because I haven’t looked at all other firearms.” (Feb. 27, 2019 Trial Tr. at 926-27)


Given the testimony at the Daubert hearing and the Government’s representations as to what it will elicit from Detective Fox, there is no need for this Court to impose limitations on Detective Fox’s opinions.

CONCLUSION

For the reasons stated above, Defendant Johnson's motion to preclude or limit Detective Fox's testimony is denied. The Clerk of the Court is directed to terminate the motion (Dkt. No. 471).

Dated: New York, New York
March 11, 2019

SO ORDERED.



Paul G. Gardephe
United States District Judge